AUSTRALIAN ACANTHOCEPHALA

No. 4

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Prosthorhynchus menurae (Johnston 1912)

(Fig. 1-8)

The material available consisted of one female and two complete and one fragmentary male, from the lyre bird, *Menura novaehollandiae*, syn. *M. superba*, Gosford district, New South Wales (Gallard collection, Australian Museum). We also re-examined the type specimen, a female, from the Queensland Museum.

The type specimen measures 19 mm. in length and 1·1 mm. in breadth, and the other female 11 mm. x 1·3 mm. Both contain mature eggs (fig. 4, 5) which measure up to 0·12 mm. in length and 0·035 mm. in breadth. In smaller eggs polar prolongations are very obvious, but in the largest eggs these are less distinct and the inner shell has a pair of lateral bulges not quite in the mid-line; such an egg is shown in fig. 5.

In the type specimen only a few of the basal hooks of the proboscis are everted but two male specimens had the proboscis everted for about two-thirds of its length, this portion measuring 1·4 mm. The fully everted proboscis would therefore be about 2 mm. long, bearing 26 longitudinal rows each of 35-40 hooks. The form of the latter varies gradually from the thin, almost rootless, basal hooks to the heavier, strongly rooted hooks of the mid-region. As far as can be judged from the inverted portion of the proboscis the anterior hooks are longer and more slender than the median ones. Hooks from the basal rows and the mid-region are figured (fig. 2, 3).

The double-walled proboscis sheath is inserted at the base of the proboscis, and measures 2·0-2·5 mm. in length and 0·3-0·37 in breadth. The ganglion lies at its posterior end (fig. 6). The very long, slender lemnisci are coiled in the anterior half of the worm. The lacunar system of the sub-cuticula is reticular at the anterior end (fig. 7) and changes gradually to the condition shown in fig. 8, where there is a pair of very distinct longitudinal vessels with regular lateral branches. The small nuclei are arranged in circular lacunae (fig. 8). The circular muscles of the body wall are very obvious and regularly arranged.

The male specimens were so much wrinkled as to be unsuitable for measurement and it proved to be impossible to make out details of their anatomy, but the testes appeared to be relatively large and situated at about mid-length.

The species was assigned by Meyer (1933) to *Prosthorhynchus*, and the re-examination of the material confirms that assignment.

Gordiorhynchus bancrofti n. sp.

(Fig. 9-16)

Host—Ninox strenua. *Locality*—Eidsvold, Burnett River, Queensland.

The description is based on four female specimens. The general body form is long and cylindrical, the length reaching to 65 mm. and the width about 11 mm. The proboscis is borne at an angle to the rest of the body and would be about 1·3 mm. long when completely everted. The proboscis sheath is inserted about 0·8 mm. behind the tip of the proboscis and measures 1·7 mm. by 0·3 mm.; the

inner wall is inserted 0·2 mm. in advance of the outer. The anterior part of the proboscis (the proboscis proper in the view of some authors, *e.g.*, Yamaguti 1935) is 0·3 mm. in width and the posterior part (neck) is slightly wider. The proboscis hooks are deeply embedded in a transparent cuticle and are arranged in 28 longi-

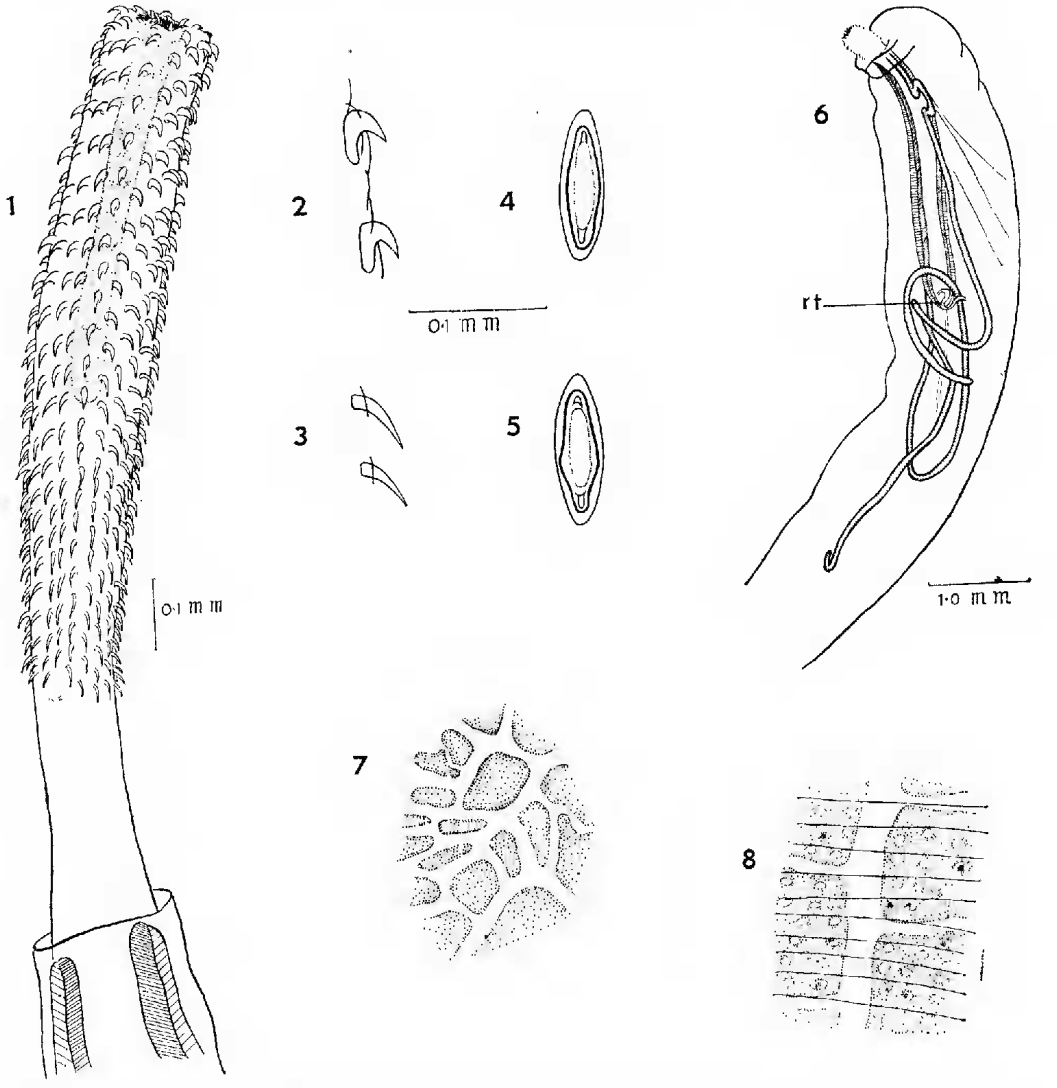
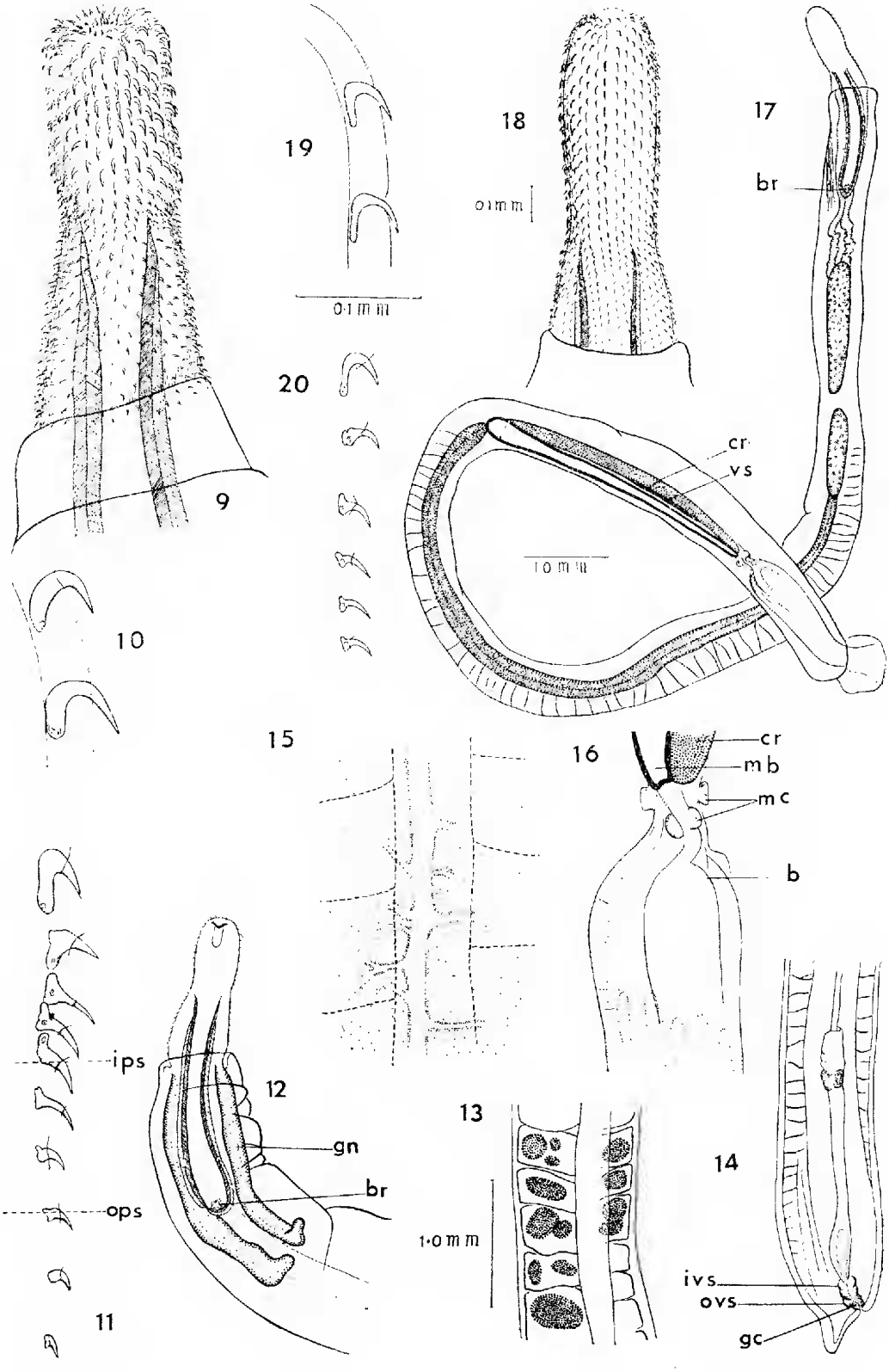


Fig. 1-8. *Prosthorhynchus memorae:* 1, proboscis; 2, hooks from mid-region; 3, basal hooks; 4-5 eggs; 6, anterior end of female; 7, lacunar system of anterior end; 8, lacunar system of mid-region of body. Fig. 2-5, to same scale; 7 and 8, to same scale. b, bursa; br, ganglion; cr, cement reservoir; gc, gland cell; gn, giant nucleus; ips, level of inner proboscis sheath; ivs, inner vaginal sphincter; mb, markbeutel; mc, muscle cell; ops, level of outer proboscis sheath; ovs, outer vaginal sphincter; rt, retinaculum; vs, vesicula seminalis.

tudinal rows each of 27-30 hooks, of which the last 11 or 12 are posterior to the insertion of the proboscis sheath. The anterior hooks are strongly recurved and have massive, backwardly-directed roots with a marked depression at the extremity. Just anterior to the insertion of the proboscis sheath these hooks give place to slighter forms whose roots are anterior. A marked depression is present in these roots also. The remaining hooks or spines have very small roots. The dimensions of representative hooks are shown in fig. 10, 11.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The paired lemnisci are solid, finger-like structures of about the same length as the proboscis sheath. They arise behind the insertion of the proboscis sheath at the base of the whole proboscis and extend 0·8 mm. behind it. The ganglion is situated at the base of the proboscis sheath. Two giant muscle cells are present in the body wall just in advance of the ganglion. The genital ligament is unusually heavy and muscular.

Except for a small portion at both ends, the body cavity is divided into a very large number of segments by partitions which extend from the body wall to the genital ligament. A cavity in the genital ligament is continuous throughout the length of the body. The ovarian balls develop in variable number within the segments of the body cavity. The lacunar system of the sub-cuticula consists of two main longitudinal vessels, between which lateral vessels form a network. The origin of these lateral vessels does not appear to be related to the underlying "pseudosegmentation" of the body cavity.

In none of the specimens were fully mature eggs found in the cavity of the uterus, the uterine bell, or the body cavity. Eggs are oval and have no polar prolongations. The uterine complex occupies a clear space where some of the muscles associated with the genital ligament pass to the body wall and the longitudinal cavity of the ligament becomes much widened (fig. 14). The uterine bell measures 0·45 by 0·2 mm., and its two posterior cells surrounding the posterior apertures are conspicuously granular. The uterus is short, 1·5 mm. in length, and the first pair of vaginal gland cells extends about 0·5 mm. into its base. The vaginal sphincter is double and the gland-cell surrounding the aperture is conspicuous, giving the appearance of a third sphincter muscle. The female opening lies to one side of a small terminal projection about 0·3 mm. in length.

The species described is obviously very closely related to the type species of the genus, *G. clitoridens* Meyer 1931, even to the presence of the terminal papilla mentioned above, but it differs from that species in the shape and armature of the proboscis, the Australian species having more numerous anterior hooks and a less abrupt change in form between the anterior and subsequent hooks, and also in the presence of the very thick cuticular layer on the proboscis. The species is dedicated to the late Dr. T. L. Bancroft, who collected it.

Gordiorhynchus falconis n. sp.

(Fig. 17-20)

A single male specimen of a species which obviously resembled the preceding in generic characters was obtained by one of us (T. H. J.) from *Falco berigora* from Hermannsburg, Central Australia. The pseudosegmentation which characterises the females of the genus was present in this case in the male.

The body form is cylindrical, length 18 mm., width 0·6 mm. The proboscis is 0·9 mm. long and 0·23 mm. wide for the greater part of its length. It narrows slightly at the level of the insertion of the proboscis sheath and the posterior portion reaches 0·3 mm. in diameter. There are 38 rows, each of 28-29 hooks, which are all of a more slender form than, though of the same general shape as, those of *G. bancrofti*. The inner wall of the proboscis sheath is inserted at the level of the seventeenth hook, 0·6 mm. behind the tip of the proboscis, and the

Fig. 9-16—*Gordiorhynchus bancrofti:* 9, proboscis; 10, anterior hooks; 11, hooks at level of insertion of proboscis sheath; 12, anterior end; 13, mid-region, to show pseudosegmentation; 14, posterior end; 15, lacunar system, indicating independence of underlying pseudosegmentation; 16, region between bursa and markbeutel showing peculiar muscle cells.

Fig. 17-20—*Gordiorhynchus falconis:* 17, male; 18, proboscis; 19, anterior hooks, 20, hooks at level of insertion of proboscis sheath. Fig. 9, 16 and 18, to same scale; 12-14 and 17, to same scale.

outer wall less than 0·1 mm. behind it. The hooks are embedded in a transparent cuticle which appears as a marked, clear area at the tip of the fully everted proboscis. The form of the proboscis and its hooks is shown in fig. 18-20, which are drawn to the same scale as the corresponding figures for *G. bancrofti* for purposes of comparison.

The lemnisci are rather slender, finger-like structures extending backwards to the level of the anterior testis. The proboscis sheath is 1·4 mm. in length and 0·2 mm. in width, and the anterior testis lies 0·7 mm. behind it. The ganglion lies at the posterior end of the proboscis sheath. The testes measure 1·4 by 0·3 mm. and 1·0 by 0·3 mm. respectively. The two long tubular cement glands pass back from the level of the posterior testis. The markbeutel is unusually long and slender, measuring 3·0 mm. by 0·3 mm., and there are a correspondingly long, narrow vesicula seminalis and cement reservoir (3·0 by 0·15 mm.). The ejaculatory duct is surrounded by six peculiar cells shown in fig. 16, 17. The bursa is partly everted in the type specimen but the pronounced appendages and bursal rays, about 14 in number, are still within the body wall.

The differences between *G. falconis* and the European species are even more marked than those between *G. bancrofti* and the type species, *G. clitorideus*. In particular the very slender form of the hooks in this species results in a very gradual change in form from the anterior hooks to those at the base which are little more than spines.

Host List

Menura novaehollandiae Lath., *Prosthorhynchus menurae* (Johnston) Meyer.

Ninox strenua Gould, **Gordiorhynchus bancrofti** n. sp.

Falco berigora Vig. and Horsf., **Gordiorhynchus falconis** n. sp.

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